TSM update

Updates from Training and Doctrine Command systems managers for battlefield computers, network management, satellite communications and tactical radio

TSM-SATCOM

AN/PSC-5 SPITFIRE PROGRESS

by Cori Braswell

The AN / PSC-5 Spitfire radio set is a line-of-sight and satellite-communications terminal. The terminal operates in the 30-400 megahertz frequency range and provides both voice and data communications. For SATCOM operations (220-400 mHz), the terminal operates both wideband (25-kilohertz channels) and narrowband (five-kHz channels) in the dedicated satellite and demand-assigned-multiple-access modes.

The terminal possesses embedded communications security to allow encryption of voice, data and orderwire transmissions. For voice and data, COMSEC includes KY-57 / 58, KG-84 and ANDVT / KYV-5 (compatible with KY-99 and KY-99A), while for orderwire transmissions, the terminal is equipped with embedded KGV-11 used only in DAMA for control.

Also, the terminal performs beyond-line-of-sight retransmission for the single-channel ground and airborne radio system nets and Spitfire-to-Spitfire retransmission for nets operating in more than one satellite footprint. The terminal is a user-owned and -operated system, replacing several existing ultra-high-frequency SATCOM terminals, including AN / PSC-3, AN / VSC-7, AN / PSC-7 and LST-5C.

The terminal is menu-driven. It allows presetting up to 19 operating modes: six presets each for SATCOM, LOS and DAMA operations, with one preset for Beacon (LOS) mode. Scanning two frequencies is available in the LOS unencrypted mode. The terminal has built-in test capability available when the terminal is first activated and upon user request.

Also, a very extensive and accurate BIT is available for terminal maintainers. Loading and updating COMSEC will be done via the mode switch and menu. The terminal is compatible with KYK-13, KYX-15, KOI-18 and AN / CYZ-10.

DAMA. Requests for UHF satellite access result in assigning an entire channel to the requester. In most cases, there's time on the channel when no one is sending transmissions. This is commonly known as "dead time" on the channels.

To use this dead time efficiently, waveforms were designed to allow other users access to the channel. This is known as DAMA and is being applied to both five- and 25-kHz channels. The process is a means of multiplexing several users at different locations onto one satellite channel by using a DAMA controller and encrypted orderwire transmissions.

The Air Force controls the five-kHz channels with net-control stations. NCSs provide access to five five-kHz channels and two 25-kHz channels — or any combination of both — per satellite footprint. The Navy is responsible for the 25-kHz channels via the DAMA semiautomatic controller, which controls up to eight 25-kHz channels per footprint. The Navy is also responsible for a future combined controller that will handle five- and 25-kHz channels on UHF follow-on satellites in each footprint.

The future system will be known as the joint milsatcom-network integrated control system. It'll provide the ability to control up to 78 channels in one footprint and back-up control for up to 78 channels in the adjacent footprint. All controllers are located in the satellite footprints' overlap area at naval computer and telecommunications area master stations.

SPITFIRE DISTRIBUTION. Spitfire, part of the combat-net-radio system of radios, will be used for BLOS communications throughout the Army. The terminal will be fielded to echelons-corps-and-below for the following single-channel nets: warfighter, intelligence / operations, administrative / logistics, fire support and multiple-launch rocket system.

Special Operations Forces will receive 1,137 terminals for their operations, and echelons-above-corps units will receive 627 terminals for BLOS nets. The Army will receive a total of 3,476 terminals, to be fielded over the next several years.

SPITFIRE TRAINING. The two military-occupation-specialty-producing schools that will provide training on Spitfire are the 31U Signal-support specialist course at the Signal Center, Fort Gordon, Ga., and the 18E course at the Special Warfare Center, Fort Bragg, N.C. Since the terminal is a user-owned and -operated device, Spitfire is being trained when fielded by Communications-Electronics Command's new-equipment training team out of Fort Monmouth, N.J.

DAMA's addition to UHF tactical-satellite communications requires extensive training in planning networks. The Training and Doctrine Command's system manager for SATCOM office has prepared and is providing training on Spitfire's tactics, techniques and procedures. Any unit receiving Spitfire terminals should coordinate with MAJ Mark Ernyei (DSN 780-4242, ernyeim@emh.gordon.army.mil) or Cori Braswell (DSN 780-7934, braswelc@emh.gordon.army.mil) to receive training at least two months before receiving the terminal. This will ensure the unit is aware of procedures for requesting and using DAMA satellite time, along with any other new issues that may arise and are associated with the terminal.

Ms. Braswell works for Information Technology and Applications Corporation/ project manager for milsatcom as contract support to TSM-SATCOM. Before she retired from the Army, she worked in a variety of tactical SATCOM positions. Her final assignment in the Signal Center's combat-developments directorate involved

developing Spitfire from its initial concept phase. She's now actively involved in terminal fielding and distribution.

GLOBAL BROADCAST SERVICE
by CPT Joe Pagnotta

Today's doctrine, based on recent lessons-learned, requires large volumes of information to be quickly delivered to deployed units for them to survive and succeed on the modern battlefield. That information — viewed as text, graphics, photographs, imagery or videoteleconferencing — requires massive transmission "pipes" (bandwidth). Many information requirements are standard strategic-type products (maps, weather data, imagery, databases, distance learning / training, Armed Forces Radio and Television Service, Cable News Network).

Other tactical information products the warfighter needs can be tailored for a specific operations area. Examples of these types of products are local weather reports, flash warning reports, theater intelligence updates, airborne reconnaissance video and local broadcast services.

Currently communications systems for mobile and deployed forces are quickly saturated in the conflict's early phases. Global Broadcast Service will allow existing (and planned) two-way communications systems to support the force's lower-volume communications needs, while providing high-speed, one-way information flow to dispersed units as well as individual warfighters on the ground.

GBS is a joint program which has leveraged commercial technology by using digital-broadcast-satellite technology to disseminate information products (one-way "pushed" traffic) to warfighters in near-real-time. Commercial industry pioneered developing direct-broadcast television service using high-powered satellites and sophisticated receiver electronics. GBS technology delivers large throughput in the form of multiple video channels directly into homes via small (18-inch) antennas and affordable compact "set top" receiver boxes. This same technology, with some necessary modifications, is adaptable to military needs.

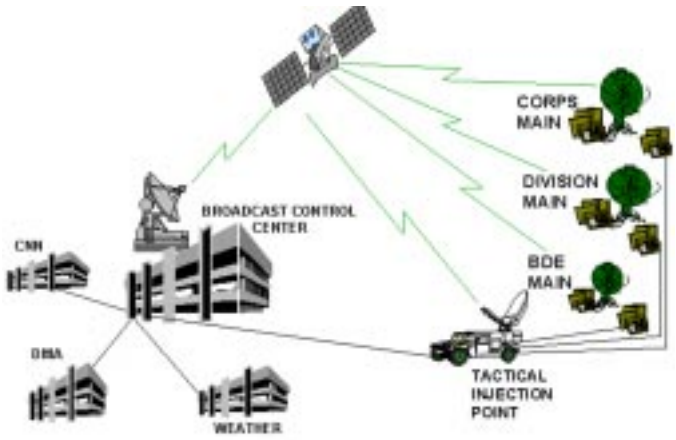

Figure 28. Global Broadcast Service links.

While commercial direct-broadcast service is tailored specifically for the television market, the technology it embodies can be modified to serve military users' information needs for a variety of high-volume data and video products. These products include high-resolution imagery, weather, mapping, situation awareness, logistics and multiple video services. Properly implemented, GBS is able to increase battlefield knowledge and awareness for commanders and contribute to operational success.

GBS is progressing well. The Army has formed integrated product teams with contractor representatives in each of GBS' major areas: systems-engineering integration and testing, transmitting, receiving and supportability. Microsoft, Adaptec and NextLevel are supplying systems architecture and software. To facilitate the production schedule and improve future upgrades, GBS takes advantage of current civilian off-the-shelf computer and broadcast technology.

Site surveys and preparations are underway, with interim capability tests slated for May. Tests are contingent on the successful launch of the eighth UFO satellite scheduled for March.

In the future, commanders will receive information distributed using a "smart push and / or user pull" philosophy. This philosophy averts saturating deployed forces with "information overload."

Smart push is the process of preselecting data and video products to support users throughout a specific operations area. Through user pull, individual users request and receive information (through normal request channels) from information producers.

Adding an in-theater mobile tactical injection point will uplink in-theater information producers (for example, unmanned-aerial-vehicle feeds) with a path for data and video dissemination.

The concept of GBS envisions winning the information war by providing critical information to the warfighter when and where requested or needed. If subsequent launches and operational tests proceed as scheduled, GBS could become a reality for the warfighter by the year 2000.

CPT Pagnotta is a project officer for TSM-SATCOM. His responsibilities include ensuring the end-user's requirements are developed and integrated throughout GBS' lifecycle. Pagnotta will take command of Company E, 1st Satellite Control Battalion, in Colorado Springs, Colo., in March.

STAR-T

The AN / TSC-156 super-high-frequency triband advanced range extension terminal is a heavy-humvee-mounted SHF triband tactical-satellite terminal that replaces the current AN / TSC-85 / 93s at corps and above. The terminal is able to operate over commercial and military satellites in the C, X and Ku frequency bands.

There are two terminal types, switch and standard. The switch version is able to support up to 280 subscribers with required ancillary equipment.

The Army will field 153 terminals: 78 switch, 75 standard. Fielding is scheduled to begin in fourth quarter FY99.

The AN / TSC-156 program instituted a new era for the Signal Corps June 27, 1997, when the Signal Center decided commercial switches should

be integrated into all switch-designated terminals. The decision aligned the Army's switching architecture with the Defense Department and began implementing the Warfighter Information Network.

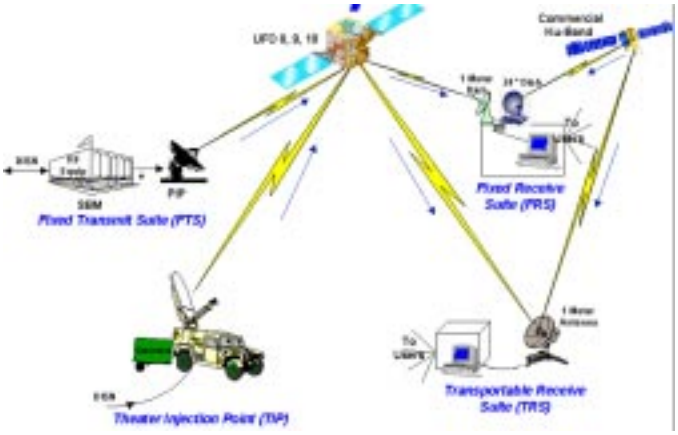

Figure 29. Components of Global Broadcast Service.

Modifications to AN/TSC-156 requirements were established, documented and initiated Oct. 9, 1997. The contractor, Raytheon, is working with the Signal Center and the project manager for milsatcom to determine the best commercial package for the terminal.

The standard terminal consisted of one heavy humvee and a towed generator. A configuration change initiated by the Signal Center resulted in two heavy humvees, one carrying the communications pallet and one carrying the mobile power unit. This provides greater flexibility and mission capability to the three-soldier crew.

Point-of-contact is CPT James Lord, DSN 780-7493.

HIGH-GAIN X-BAND ANTENNA

The AS-4429/TSC lightweight high-gain X-band antenna is a trailer-mounted, SHF X-band, 16-foot-diameter antenna with a gain-over-noise-temperature of 28 decibels. It can be towed by a heavy humvee or larger vehicle and is C-130 roll-on/roll-off capable. It has a 45-minute set-up/tear-down time with a two-person crew, or a 30-minute set-up time with a three-person crew.

AS-4429/TSC interfaces with the current AN/TSC-85B/93B terminals and will be used with AN/TSC-156 (STAR-T).

The Army will field 44 AS-4429 antennas, one per AN/TSC-85B at EAC and corps-level Signal units.

Technical testing for AS-4429 is slated for second quarter FY98. The operational test is scheduled for third quarter FY98 with 112th Signal Battalion at Fort Bragg.

Fielding is scheduled to start after the operational test for 112th Signal Battalion and 35th Signal Brigade.

POC is CPT James Lord, DSN 780-7493.

TERMINAL MODERNIZATION PROGRAM

The AN/FSC-78 and AN/FSC-79 heavy terminals and AN/GSC-39 medium terminals — high-capacity strategic satellite-communications terminals operating over the Defense Satellite Communications System and deployed to strategic fixed locations worldwide – are being modernized. This modernization will extend the terminals' operational life 15-20 years by refurbishing and modernizing radio-frequency electronics.

Modernization offers reduced maintenance and logistics costs and enhances the program lifecycle overall. Improvements encompass the converter group, radio-frequency amplifier assembly, frequency-timing standard, plus control monitor and alarm system.

An assessment team assessed HTs and MTs for three weeks in August 1997. System operation, NET, resident training and on-site training were discussed, along with logistics support. The HT/MT program is scheduled for completion in December.

For more information, contact Frank Stein, DSN 780-7903, or via electronic mail at steinf@emh.gordon.army.mil.

DSCS OPERATIONS CENTERS

Objective DSCS operations centers will consist of five climatically controlled, fixed operations centers

Figure 30. Heavy terminal.

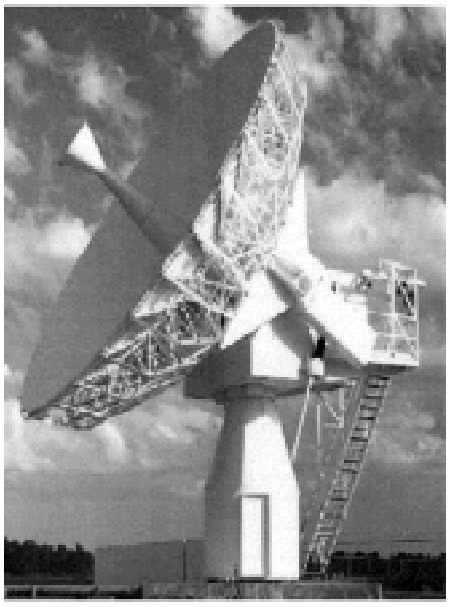

Figure 31. Medium terminal.

established worldwide. The ODOC program will modernize and procure new equipment for the current satellite-control DSCS operations-center facilities.

ODOC will provide real-time operational control of orbiting communications satellites and ground-based equipment, including satellite-platform control and space-segment allocation for communications networks.

The United States and its allied forces will interface with ODOC to obtain satellite access. The Army operates ODOC.

Some of ODOC's characteristics

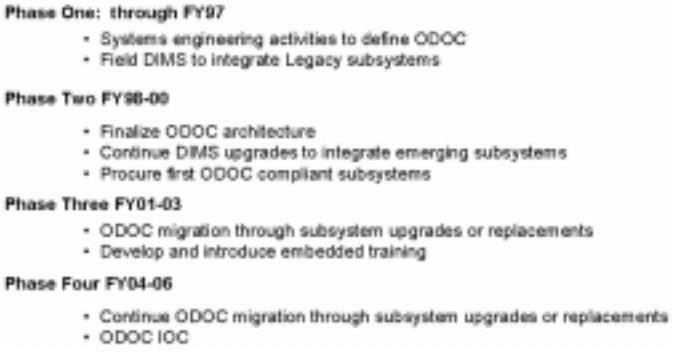

Figure 32. ODOC phases.

are:

• Replaces current DSCS operations centers one for one;

• Integrates management capability for primary management and monitoring functions;

• Is able to maintain satellite orbit as the Air Force satellite-control network backup;

• Performs control functions from a single console;

• Supports six operator / maintenance / training consoles from one common database; and

• Apportions leased commercial satellite resources.

TSM-Tactical Radio

EPLRS

The very-high-speed integrated-circuit enhancements are complete on the enhanced position-location reporting system's low-rate-production units. In July 1997, all radio sets fielded to 1st Cavalry Division and 3d Infantry Division were upgraded. This allows data-rate transfer up to 57 kilobits per second.

The FY97 bridge-buy system-improvement plan radio sets (325) will be delivered in FY98. These radios will be used to support Task Force XXI's rapid-force-projection initiative and integration efforts.

The full-rate-production FY97 / 98 EPLRS multiyear contract was awarded Sept. 16, 1997. The contract purchases 2,057 radios for the Army, with 335 for the Air National Guard and Reserve. These units will have increased capabilities (doubled current data rate, capability for bandwidth on demand, externally reprogrammable software) and a significantly reduced price (less than $28,000 a unit).

Retrofit kits were also procured to upgrade previously purchased radios to new capabilities. The contract also included the chance to buy more units in FY98 at prices as low as $26,000. The Navy, Marine Corps and Air Force will procure more EPLRS under this contract, but the numbers aren't available yet.

Lessons-learned from the Task Force XXI advanced warfighting experiment and the Signal Center's system-architecture development have identified more requirements for data radios to digitize the force. The current Army acquisition objective allows the Army to fully field the first digitized corps and partially field 3d Mechanized Infantry Division.

Organizations not receiving any data-radio capability until FY02 to FY04 include XVIII Airborne Corps, 82d Airborne Division, 101st Air Assault Division and the rest of 3d Mechanized Infantry Division. The Chief of Signal recommended Oct. 22, 1997, the AAO for EPLRS be raised from 5,015 to 8,157 radios and from 23 to 41 NCSs to adequately equip the first digitized corps, Force Package 1, division forward-area air-defense battalions and the training base.

EPLRS has completed LRIP fielding. Engineering-and-manufacturing-development phase is ongoing, which repackages and upgrades the radio set as well as NCS. The Milestone III decision was completed in February 1997. FRP fielding will begin in late FY98. Fielding of four downsized NCSs to 13th Signal Battalion was finished in January.

POC is Ted Fillgrove, DSN 780-7944.

NTDR

The near-term digital radio system will provide a mobile packet-data-radio network to serve users mostly at brigade and below. Interoperability between NTDR networks and the tactical Internet can be achieved through gateways.

The NTDR system performed well during the Division XXI AWE. The system proved very effective in its role of providing data transport among the division's tactical-operations centers.

POC is Jack Keever, DSN 780-7959.

JOINT TACTICAL RADIO

The joint-tactical-radio system has expanded the Army's future-digital-radio requirements to include requirements unique to the other services. The JTR system's hardware and software will be designed to an open-system architecture, producing secure digital radios suitable for dismounted soldiers, surface vehicles, maritime operations and aircraft applications.

The JTR program will produce a product to meet requirements for a joint secure tactical-data-networking radio system, with embedded capabilities for position location. The objective system will consist of a family of secure digital radios for simultaneous multiband, multimode operations within the spectrum from two megahertz to three gigahertz.

JTR will serve selected users needing multiple paths for voice and / or data information exchanges. JTRs can be configured and / or programmed in the field to operate on multiple bands and modes at the same time across multiple networks while automatically routing data within and between applicable networks.

We anticipate a long transition period to displace legacy radios with objective JTRs. During this time, the migration strategy is to gradually displace legacy radios with JTRs without major impact on operational forces. The strategy will support displacement on a priority basis and on schedules supported by program funding and production capacity.

The Joint Requirements Oversight Council approved the JTR mission-needs statement in August 1997. Using the Army's draft FDR operational requirements document as a

starting point, the joint ORD working group finalized the joint ORD in December 1997. The ORD was scheduled for JROC review in January.

A joint program office for JTR was established in November 1997.

POC is Jack Keever, DSN 780-7959.

JTIDS CLASS 2M

All 20 of the joint tactical-information-distribution system product-improved engineering-developmental-model terminals procured in FY94 from GEC Marconi have been delivered. JTIDS' LRIP (35 terminals) terminal deliveries started in January.

FRP — approved for 34 Class 2M terminals, with an option for 11 more in FY98 — requires corrective actions to be verified in resolving suitability issues from JTIDS Class 2M's initial evaluation; a customer test at Fort Bliss, Texas, verified corrective actions to technical manuals and NET were satisfactory. Initial results of the test, which ended Dec. 17, 1997, were available in January to facilitate a material-release decision.

POC is MAJ Michael McDuffie, DSN 780-7861.

SINCGARS

The single-channel ground and airborne radio system's advanced system-improvement plan radio, or ASIP radio, will receive a customer test at Fort Bragg Sept. 8-25 with Company A, 82d Signal Battalion as the test unit. The last week of August will be used for key-personnel training, and the first week of September as operator / data-collector training.

The customer test's main goal is to help the SINCGARS product manager make a quality-control check and verify that product improvements made to ASIP are suitable to field operations. The test will focus on human factors, safety and training.

Other tests — such as interoperability, range or electrical — will be done either in-plant at the contractor's facility or at the product manager's test facility at Electronic Proving Ground, Fort Huachuca, Ariz.

The ASIP radio continues SINCGARS' evolution. Highlights are:

- Reduced weight (less than 10 pounds for combined radio, handset, battery and antenna) in a manportable configuration;
- Enhanced SIP waveform;
- Fast channel-access protocol;
- ESIP retransmit;
- F1:f1 repeater;
- Power reductions which provide one-third more battery life; and
- Reprogrammability, including being field-upgradeable through the front panel.

With ASIP's smaller front panel, some of the radio's keypad functions are now included in a menu structure. These include volume, channel selection, mode, power and communications security. In the manpack configuration, these menu features will be used with the handheld remote-control radio device.

All other operator functions remain the same as those in the current family of SINCGARS radios.

POC is Glenn Strellner, DSN 780-5412.

TSM-Network Management

ISYSCON

Integrated-systems control systems and workstations are at Fort Hood, Texas, being used to instruct Test and Experimentation Command test-data collection personnel. A Signal Center team briefed 3d Signal Brigade Dec. 11, 1997, on the doctrine, training, leadership development, organization, materiel and soldiers data supporting the ISYSCON program and on developing collective training for the test unit.

The 3d Signal Brigade received test-player training Jan. 5-30, and in February will conduct collective training at the team level. This training culminates with the ISYSCON program's initial operational test and evaluation slated March 7-25.

POC is MAJ Doug Kuehl, (706) 791-7941, e-mail kuehld@emh.gordon.army.mil.

DIVISION WARFIGHTING EXPERIMENT

The division advanced warfighting experiment ended Nov. 13, 1997, at Fort Hood. Network management consisted of the network-management tool, precursor to ISYSCON; router-management tool (Sun domain manager, a commercial-off-the-shelf NM product), which managed "edge" routers and selected tactical-operations center local-area networks; and another COTS NM product, Simple Network Management Protocol c, which monitored routers throughout the network.

Team Signal had a full report available on NM from all DAWE initiatives in January.

POC is MAJ Bill Davis, DSN 780-4781, e-mail davisjw@emh.gordon.army.mil.

TSM-Battlefield Computers

The battlefield-computers TSM's mission is to centrally manage all combat-developments user activities for the Army battle-command system's common-hardware-and-software program and to technically integrate ABCS and Army command-and-control systems. TSM-BC also supports tactical-management information-system products, including the combat-service-support automated information-systems-interface program.

CHS PROGRAM

ABCS' CHS is a family of state-of-the-art commercial-off-the-shelf nondevelopmental-item computers, peripherals, operating systems, utilities, system-support software and applications software. The CHS program gives the Army enough flexibility in developing automated systems to satisfy a range of functional needs. CHS computers and peripherals are available as system components and are used as the basis for the five battlefield-functional-area systems and subsystems, including ISYSCON.

CHS' project manager has included the compact computer unit's ruggedized version (V2) on the CHS-2 contract. CCU is a portable workstation with an integral flat-panel display and keyboard, providing the same

performance and functionality as the high-capacity computer unit Sparc20 workstation; the UltraSparc1 configurations provide increased performance over HCU. CCU dimensions are 19 ¼ inches wide by 14 ½ inches high by 7 ½ inches deep (in transport configuration), weighing 37 ½ to 50 pounds. CCU represents a reduction in CHS-2 equipment size and weight, yet maintains the processing power.

The Sparc20 workstation's commercially packaged HCU (V1) version will be unavailable as a result of the product's end-of-life status — except to customers who provide forecaster-quantity requirements. The Sparc20's V2 version will be available for an extended time to support existing applications relying on it. However, a next-generation HCU being evaluated, called HCU-2, should be available by March. HCU-2 will be available in V1 and V2 versions, with either a 270-mHz or 300-mHz 64-bit UltraSparc-IIi processor.

POC is MAJ Gregory Johnson, DSN 780-3779.

COMMON OPERATING ENVIRONMENT

When the program executive office for command, control and communications systems provided policy guidance for the Army's joint-technical-architecture migration and mandated ABCS systems' compliance with the defense information infrastructure's common operating environment, ABCS project managers were tasked to provide COE final-transition plans by Oct. 1, 1997.

Comprehensive plans are to include schedules for attaining Level 6 COE compliance — as defined in the DII COE integration and runtime specification — as rapidly as programmatically possible. Level 6 yields a degree of integration that provides marginally acceptable interoperability.

By Jan. 1, 2000, all systems must, as a minimum, integrate into their software the distributed computing environment, common message processor, communications server, ABCS common database and joint mapping toolkit DII COE products. Plans will include steps for achieving Level 8 compliance (full DII COE compliance), which provides complete interoperability.

POC is Marvin Macuch, DSN 780-6623.

DAWE

ABCS components participating in DAWE included maneuver-control system, all-source analysis system, advanced field-artillery tactical-data system, forward-air-defense command-and-control, combat-service-support control system, integrated meteorological system, digital-topographic-support system, combat-terrain-information system and aviation-mission-planning system.

These Unix-based command-and-control systems were used to allow commanders to clearly see and understand their battlespace and to leverage that information. The CHS that ABCS operated on were very reliable computer systems throughout the exercise. Managing the local-area networks these systems operated on was done via COTS products operating on laptop computers.

Some tactical-operations centers used the Windows 95 operating system with the following software applications: SNMPc Version 4.1g; Cisco Works 2.1 for Windows; Camelion Netmanage Transmission Control Protocol / Internet Protocol, which provided file-transfer-protocol server and client; tactical FTP Server; Telnet; hyperterminal; webserver; and a Mitre-developed tool called the personal computer router-analysis tool.

Other TOCs used the Unix operating system with a software application called Sun Domain Manager to manage LANs. Team Signal wrote a graphical training aid on each communications initiative. GTA provided Signal soldiers in TOCs with trouble-shooting / operation procedures for ABCS, LAN and new communications equipment.

DAWE will have many DTLOMS impacts. Changes in technology are causing the standard doctrine issue of "user-owned, user-operated" to be better defined. Because of many training issues, instruction programs at the Signal Center will be modified. Leadership-development issues will affect all schools, but especially the Signal Center, since it doesn't currently teach ABCS operations. Organization issues may involve force-structure trade-offs directly tied to information dominance. Material issues involve finding the right mix of COTS and non-commercial products to simplify this very complex network with evolving software and hardware. Lastly, soldier issues mandate increasing automation-trained soldiers for a digitized force.

More details on ABCS and LAN management are included in Team Signal's DAWE-initiatives final report.

POC is CPT LaShawn White, DSN 780-3771.

CAISI

CAISI devices were fielded to 10th Mountain Division, Fort Drum, N.Y., in June 1997, and 1st Cavalry Division, Fort Hood, Texas, in July 1997.

Based on the Milestone III granting authority to field CAISI mid-term to the rest of the Army's CSS units, CAISI was fielded to 2d Infantry Division, Camp Casey, Korea, in September 1997 and to the rest of Korea's CSS units at EAC in December 1997.

Fielding is scheduled to continue with III Corps Europe and I Corps during FY98 and FY99.

POC is Jim Hillis, DSN 780-7864.

Acronym Quick-scan

AAO – Army acquisition objective
ABCS – Army battle-command system
ASIP – advanced system-improvement plan
AWE – advanced warfighting experiment
BC – battlefield computers
BIT – built-in test
BLOS – beyond-line-of-sight
CAISI – c(ombat-service-support) automated information-systems interface
CCU — compact computer unit
CHS – common hardware and software
COE – common operating environment
COMSEC – communications security

Acronym Quick-scan (CONTINUED)

COTS – commercial-off-the-shelf
CSS – combat-service support
DAMA – demand-assigned multiple access
DAWE – division advanced warfighting experiment
DII – defense information infrastructure
DSCS – Defense Satellite Communications System
DTLOMS — doctrine, training, leadership development, organization, materiel and soldiers
EAC – echelons-above-corps
EPLRS – enhanced position-location reporting system
ESIP – enhanced system-improvement plan
FDR – future digital radio
FRP – full-rate production
FTP – file-transfer protocol
FY – fiscal year
GBS – Global Broadcast Service
GTA – graphical training aid
HCU — high-capacity computer unit
HT – heavy terminal
ISYSCON – integrated-systems control
JROC – Joint Requirements Oversight Council
JTIDS – joint tactical-information-distribution system
JTR – joint tactical radio
KHz – kilohertz
LAN – local-area network
LOS – line-of-sight
LRIP – low-rate initial production
MHz — megahertz
Milsatcom – military satellite communications
MT – medium terminal
NCS – net-control station
NET – new-equipment training
NM – network management
NTDR – near-term digital radio
ODOC – objective D(efense Satellite Communications System) operations center
ORD — operational requirements document
POC – point-of-contact
SATCOM – satellite communications
SHF – super-high frequency
SINCGARS – single-channel ground and airborne radio system
SIP – system-improvement plan
SNMPc — Simple Network Management Protocol c
STAR-T – s(uper-high-frequency) triband advanced range extension terminal
TOC – tactical-operations center
TSM – T(raining and Doctrine Command) systems manager
UFO – u(ltra-high frequency) follow-on
UHF – ultra-high frequency